Microbiologists

What They Do

Microbiologists study the growth, characteristics, and effects of bacteria and other microorganisms to better understand their relation to human, plant, and animal health. They look for unwanted microorganisms in raw materials and in finished products. Using various pieces of equipment, they examine microorganisms to ensure that company and regulatory quality standards are being met. They are also responsible for maintaining good records of their studies.

Microbiologists in biotechnology use microscopes to examine the physiological, morphological, and cultural characteristics of microorganisms in humans, water, food, and plants. They research, identify and classify these microorganisms to develop products such as vitamins, antibiotics, amino acids, grain alcohol, sugars, and polymers. They conduct experiments, often with minimal guidance, operating and maintaining laboratory equipment and working according to good laboratory procedures (GLP) safety guidelines.

They perform activities related to cell harvesting, downstream processing, and product recovery or isolation. During both research studies and the manufacturing process, Microbiologists must screen for any novel organisms and activities. In addition to documenting the progress of their experiments and findings, they write and execute technical studies.

Microbiologists analyze products by developing offline assays. They ensure the production of recombinant microorganisms (e.g., a combination of DNA molecules taken from different sources).

These workers must be able to communicate with research team members and production staff at all levels. They must also be emotionally flexible, ready to change direction quickly during an experiment as situations change.

Important skills, knowledge, and abilities include:

- Biology – Knowledge of plant and animal organisms, their tissues, cells, functions, interdependencies, and interactions with each other and the environment.
- Chemistry – Knowledge of the chemical composition, structure, and properties of substances and the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques, an disposal methods.
- Written Comprehension – The ability to read and understand information and ideas presented in writing.
- Active Learning – Understanding the implications of new information for both current and future problem-solving and decision-making.
- Science – Using scientific rules and methods to solve problems.
- Deductive Reasoning – The ability to apply general rules to specific problems to produce answers that make sense.

Training/Requirements

- Bachelor or master's degree in microbiology.

Employment Development Department
State of California
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What's the California Job Outlook?

The California outlook and wage figures below are drawn from all industries and represent the occupational group Microbiologists.

Standard Occupational Classification	Estimated Number of Workers 2002	Estimated Number of Workers 2012	Average Annual Openings	2005 Wage Range (per hour)
Microbiologists				
19-1022	1,600	2,200	110	$22.58 to $37.74

These figures do not include self-employment.
***Average annual openings** include new jobs plus openings due to separations.*
Source: www.labormarketinfo.edd.ca.gov , Employment Projections by Occupation and OES Employment & Wages by Occupation, Labor Market Information Division, Employment Development Department.

Additional Sources of Information

American Society for Microbiology
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Washington, D.C. 20036-2904
(202) 737-3600
www.asm.org

Institute of Food Technologists
525 W. Van Buren, Suite 1000
Chicago, IL 60607 USA
Fax: 312-782-8348
www.ift.org

Occupational Information Network (O*NET)
http://online.onetcenter.org

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